Marie-Curie Research-Training Network GoverNat:
Multi-level Governance of Natural Resources:
Tools and Processes for Biodiversity and Water Governance in Europe

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Environmental Governance: Participatory, Multi-level – and Effective?

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"Multi-level Governance of Natural Resources: Tools and Processes for Water and Biodiversity Governance in Europe"

(GoverNat)

Objectives

The **overall objective** of GoverNat is to develop new solutions for multi-level environmental governance and to facilitate their use by decision makers in an enlarged EU. The **central research objective** is to test the hypothesis that certain participatory processes and analytical decision tools are particularly useful for improving multi-level environmental governance. **Specific research objectives** therefore address the enhanced understanding of multi-level governance of natural resources, the development of methods of public and stakeholder participation to be used in such contexts, the effective utilisation of specific analytical decision tools in multi-level governance, and the reflective evaluation of such use. These four tasks are necessarily interdisciplinary. The **central training objective** is to give 9 doctoral and 3 post-doctoral fellows an interdisciplinary training 1) in research on environmental governance, particularly of biodiversity and water, in Europe, and 2) in designing legitimate and effective solutions for communication between policy makers, scientists and the public in science/policy interfaces.

Consortium

1. UFZ – Helmholtz-Centre for Environmental Research, Germany (F. Rauschmayer);
2. ECOMAN - Ecological Economics and Management, Lisbon, Portugal (P. Antunes);
3. NERI - Danish Environmental Research Institute, Copenhagen, Denmark (M. S. Andersen);
4. SRI - Sustainable Research Institute, Leeds, United Kingdom (J. Paavola);
5. ICTA – Institute for Environmental Science and Technology, Barcelona, Spain (S. van den Hove);
6. CSWM – Centre for the Sustainable Water Management, Lancaster, United Kingdom (W. Medd);
7. UStutt - Institute for Sociology, Stuttgart, Germany (O. Renn);
8. IF - Institute of Forecasting, Slovak Academy of Sciences, Bratislava, Slovak Republic (T. Kluvánková-Oravská);
9. IELM-SIU - St. Istvan University, Budapest, Hungary (G. Pataki);
10. IREAS - Institute for Structural Policy, Slovak Republic (V. Chobotova).

Characteristics

- EU Marie Curie Research Training Network with 9 doctoral and 3 post-doc fellows
- Duration: 4 years (10/06 – 9/10)
    - Doctoral fellows: 4/07-6/10
    - Post-docs: 7/07-1/10
- 10 partners and several praxis affiliates in 9 European countries
- Coordination: Helmholtz-Centre for Environmental Research – UFZ (Dr. Felix Rauschmayer)
- Total contribution of European Commission: 2.4 Mio €
- Links water and biodiversity, participation and decision tools in a governance perspective

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Environmental Governance:
Participatory, Multi-level – and Effective?

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Abstract

Current international and European Union environmental policies increasingly promote collaborative and participatory decision-making on appropriate and multiple governance levels as a means to attain more sustainable policies and a more effective and lasting policy implementation. The entailed shifts of geographical scale of governance can be exemplified by the EU Water Framework Directive in that higher-level policies are devolved not only to the member states but to local collaborative decision-making bodies on natural as opposed to territorial scales. To date, empirical evidence and theoretical considerations have remained ambiguous about the environmental outcomes of such modes of governance. At the same time, the relationship between multi-level governance and non-state actor involvement remains a largely uncharted terrain. Accordingly, a twofold research agenda is mapped out: How does public participation work in different governance contexts? And what potential do multi-level governance environments have to foster the effectiveness of participatory governance? Drawing on scholarly literature on multi-level governance, policy implementation, public participation and complex systems, we develop five sets of hypotheses on how the number of policy levels and geographical rescaling affect citizen participation, actor interests and policy outcomes. We present empirical results based on a comparative meta-analysis of 47 case studies in environmental governance in North America and the EU, combining qualitative and quantitative methods.

Keywords: Civic participation, multi-level governance, re-scaling, policy implementation, institutional fit, meta-analysis, case survey.

1. Introduction

Environmental policy in Europe and elsewhere has been suffering from a lack of effectiveness (Lenschow 1999; CEC 1999; Jordan 2002; Knill & Liefferink 2007). As a response, two key strategies have been proposed and partly pursued: (1) to adapt the level and spatial scale of governance to that of the environmental problems; and (2) to enhance participation of non-state, civil society actors in environmental decision-making:

(1) Environmental problems appear on different and more or less distinct spatial scales. Whereas soil contamination on a hazardous waste site may remain a strictly local problem, water pollution typically extends the scale of a river basin (and beyond), and climate change and biodiversity loss indicate the global level of cause-and-effect-chains. Typically, these scales of socio-ecological interlinkages cut across and transcend established administrative territorial jurisdictions. In order to effectively respond to environmental problems, it has repeatedly been proposed to adapt the scale of governance institutions to that of the environmental issue (Young 2002). Increasingly, functionally specific governance institutions on natural spatial scales are being marshalled (Hooghe & Marks 2003). For instance, the European Water Framework Directive (2000/60/EC) mandates river basins as the relevant unit for planning, management and protection of inland waters. To date, a high number of vertical, horizontal and, across these, task-specific levels of governance exist in Europe. Thus, environmental governance has become a highly complex system of decision points (Meadowcroft 2002). Yet such systems 'of multi-level governance' (Marks 1993; Scharpf 1997; Benz & Eberlein 1999) raise their own problems of effectiveness. From the perspective of policy implementation theory, a high number of decision points (‚clearance points'; Pressman & Wildavsky 1984 [1973]) and involved actors (veto players Tsebelis 1995) hampers effective policy delivery. On the other hand, 'polycentricity' is regarded as conducive to long-term effective environmental policy (Ostrom et al. 1961; McGinnis 1999b).

(2) An important aspect of governance – as opposed to government –, and of multi-level governance in particular, is the participation of non-state actors in decision-processes on the different levels of governance (Bache & Flinders 2005; Papadopoulos 2007). In this context, a stronger decentralization in policy implementation is advocated. In Europe, next to a mere devolution of environmental competences to the member states (Jordan 2002), the active involvement of citizens and local interest groups in policy implementation is increasingly mandated. Prominently, the European Commission's White Paper on Governance (2001) and the

report by the Mandelkern Group on Better Regulation (Mandelkern group 2001) represents stimulating impulses for the architecture of European governance. In the light of increasing policy implementation gaps (Jordan 2002), the document develops criteria for 'good European governance' and marshals novel procedures for 'better regulation', including extended stakeholder consultations . In the field of environmental policy, in particular the inclusion of non-stake actors into policy-making achieved prominence thanks to four EU directives pushing forward more collaborative forms of governance, for example, the Water Framework Directive (2000/60/EC) and the Public Participation Directive (2003/35/EC). The guidance document on public participation in relation to the Water Framework Directive explicitly states that "public participation is not an end in itself but a tool to achieve the environmental objectives of the directive" (EU 2002, p. 6). Drawing on the academic literature (Steele 2001; Pellizzoni 2003), participatory governance is expected to contribute to improving the 'quality' of decisions by incorporating locally held knowledge and by opening up the political arena for environmental interests. Further, it is argued that the inclusion of stakeholders increases the acceptance of decisions and thus improves compliance and implementation on the ground (Macnaghten & Jacobs 1997; Schenk et al. 2007). Based on these prerequisites, participatory and collaborative forms of governance are expected to lead to more effective improvements in environmental quality (Newig 2007; Dietz & Stern 2008).

Neither of these claims regarding the potential effectiveness of multi-level and participatory governance has remained undisputed, nor systematically empirically substantiated. It is argued, for instance, that many societal and environmental problems can be tackled best at higher levels of governance, in particular in those cases when local decisions would be taken at the expense of third parties because of the dominant interest structures of local actors. This is typically expected with environmental problems characterised by increasingly complex spatial interrelations of societal and ecological processes (Jordan 2000; Meadowcroft 2002; Young et al. 2006). To date, empirical research has yet to provide evidence for the superiority of collaborative and multi-level forms of governance in terms of policy effectiveness. Thus it has recently been concluded that "a considerable gap remains in our understanding of the effect of process characteristics and policy outputs on environmental outcomes. (…) We need to know which types of decision-making processes – multisectoral collaboration, hierarchical planning, command and control regulation, or market-based mechanisms – perform best in terms of environmental outcomes" (Koontz & Thomas 2006, p. 118; see also Beierle & Cayford 2002, p. 76).

A particular challenge for research (and practice) arises from the fact that the question of (civic) participation is invariably connected to the issue of governance level, because participation is always carried out on a particular – typically local or regional – level (Carter 2005). For instance, the perceptions and preferences of citizens and interest groups are presumably not neutral regarding the spatial distance to environmental resources or problems, neither is the engagement of actors neutral regarding the level of governance (Koontz 1999). Although it is plausible to assume that there is unexpected potential and fundamental contradictions embedded in the relationship between participation and multi-level governance, this has not yet been the subject of scholarly attention (except in Warleigh 2006).

In an attempt to respond to the outlined research gaps, this paper explores whether and to what extent the existence of multiple levels of governance affects the ability of participatory decision-making to deliver high quality environmental policy output and to improve implementation and compliance. To this end, the academic literature on multi-level governance, public participation, policy implementation as well as on complex systems is integrated in order to develop hypotheses on the relationship between multi-level governance and environmental public involvement (section 2). After a brief discussion of research design (section 3), empirical findings based on a meta-analysis of 47 case studies from Northern America and Western Europe will be presented (section 4). Section 5 is dedicated to our conclusions and the outlook for further research.

2. Theory and hypotheses

Multi-level governance (MLG) has been defined as ‘political structures and processes that transgress the borders of administrative jurisdictions, aiming to cope with interdependencies in societal development and political decision-making which exist among territorial units’ (Benz 2006: 95, translation JN). Systems of governance at different levels are typically assumed not to be hierarchical in a chain-of-command sense (Bache & Flinders 2005), but rather to comprise formally independent, yet mutually interacting governance levels, which can be distributed either ‘vertically’ or ‘horizontally’ (Scharpf 1997; Papadopoulos 2005; Paavola 2008). One central assumption of MLG research is that decision-making at different levels is increasingly characterised by the participation of non-state actors (Bache & Flinders 2005). However, little is known on the concrete relationship between participation and the multi-layeredness of governance, and how this influences governance effectiveness.

Integrating conceptual insights from different strands of scholarly research such as participation, policy implementation and complex systems research, we find that a number of hypotheses can be put forward regarding the relationship between participatory governance, multi-level aspects and environmental outcomes. As a guiding hypothesis, we assume quite generally that the choice of governance scale and level as well as the nature of participation (or its absence) in governance decisions affects environmental outcomes. We assume that scale matters, that participation matters, and that the way in which the two combine is of particular importance.

1. Participatory versus top-down modes of governance

Recent participation literature stresses the effectiveness that participation brings to governance. It is argued that the involvement of local lay knowledge leads to better informed decisions, enables social learning and thus helps to reveal win-win-potential and, overall, fosters more sustainable decisions (Yearley et al. 2003; Pellizzoni 2003). Moreover, it is assumed that involvement of non-state actors in local decision-making has the potential to open up established, non-sustainable actor networks for ecological matters such that participatory decision-making yields outputs with a stronger ecological standard (Dryzek 1997; Smith 2003).

H 1 a: Participation of non-state actors leads to more ‘ecologically rational’ decisions than in top-down modes of governance.

On the other hand, it is postulated that public involvement effectively responds to implementation deficits in eco-politics by increasing non-state actors’ acceptance and compliance (Macnaghten & Jacobs 1997; Bulkeley & Mol 2003). This is based on the assumption that societal opposition will decrease once non-state actors find the preferences and interests they voiced in a participatory process represented in the final policy decision. Procedural justice research (Lind & Tyler 1988; Tyler 1990) suggests, moreover, that acceptance of public policy will be high even in cases of substantial disagreement or lack of consideration of non-state actor interests as long as the decision-making procedure is regarded fair and legitimate. Taking the cue from participatory democratic theorists who highlight the legitimacy benefits of involvement procedures, scholars assume that collaborative forms of decision-making contribute to higher levels of acceptance and implementation rates (Sabatier et al. 2005).

H 1 b: Participation of non-state actors leads to improved compliance with decisions and thus better outcomes and impacts in ecological terms than top-down modes of governance.

2. Spatial relevance of actor interests

Spatial scale is important regarding actors' perceptions, interests and problem-solving potential that vary with their spatial relationship to the relevant environmental goods or problems (Schmitter 2002; Hein et al. 2006; Hunsberger & Kenyon 2008). It was observed that citizens living in close spatial proximity to a natural resource tend to favour its economic use, whereas those living at a greater distance tend to favour resource conservation (Koontz 1999).

H 2 a: Citizens living in close spatial proximity to a natural resource tend to favour its economic exploitation, whereas those living farther away tend to favour its conservation.

Ecological goals can often be more effectively pursued at higher spatial scales, economic goals more effectively at lower spatial scales (Koontz 1999), because local policy-makers tend to be subject to higher economic pressure compared with those at higher levels of governance (Sabatier 1974). Participatory processes tend to be more professionally managed at higher governance levels (Rockloff & Moore 2006), while at the same time specific knowledge regarding local matters decreases.

H 2 b: Where decision competences regarding environmental issues are at lower levels of governance, a stronger and more influential participation of citizens with economic interests can be expected.

3. Local-scale versus higher-scale decision-making

Drawing again on Dahl 1994, there are strong arguments to support that collective matters (and environmental problems, in particular) can typically be dealt with more effectively on wider (e.g. national or supranational) rather than very local scales (Flynn 2000). The central argument is that local activities often have distant effects harmful to the environment; in economic terms, negative externalities or regional spillovers (Oates 1999). An attempt to solve such problems locally presents a 'collective-action dilemma' (Hardin 1968; Olson 1969) in which the costs ensuing from local environmentally conscious behaviour are greater than the benefits experienced at this level – the burden of cost is experienced locally, while the benefits extend further than the local community. Preferences of local participants are thus assumed typically to be less in favour of environmental action. Moreover, local administration is assumed to be more susceptible to lobbying (regulatory capture) by economic development interests (Demmke 1997). In addition, it is often argued that at higher spatial scales partici-

pants have a greater competency (Rockloff & Moore 2006), such that more suitable and better decisions in ecological terms are taken at this level.

H 3 a: The environmental effectiveness of decisions correlates *positively* with the scale of the governance unit.

On the other hand, many participation scholars hold that – consistent with hypotheses H 1 and H 2 – local governance, especially when strongly participatory, is more likely to lead to ecologically rational outcomes than governance on higher spatial scales (Leach et al. 2002). This involves arguments of the usefulness of local lay knowledge (Steele 2001; Pellizzoni 2003; Yearley et al. 2003), but also of the capacity of local groups to self-organise and thus better ensure social control, acceptance and compliance (Ostrom 2005, 1990; Ostrom et al. 1961):

H 3 b: The environmental effectiveness of decisions correlates *negatively* with the scale of the governance unit.

4. Spatial fit between governance scales and natural scales

A growing body of literature, rooted in the theory of complex adaptive systems, deals with the sustainability of coupled social-ecological systems (Adger et al. 2003; Berkes 2002; Armitage 2008). It studies the interactions and tensions between different scale levels and dimensions. A central issue is the (mis)fit between natural and institutional (governance) scales – environmental problems and the multiple factors that cause them extend differentially in space and exhibit different geographical patterns. These typically cut across territorial governance units, involving spillovers in neighboring jurisdictions. If, for instance, air pollution is caused in one jurisdiction but extends into others, co-operation between both will be necessary in order to resolve the problem at hand. The central conclusion is to improve the spatial fit between governance and natural scale dimensions: ‘Overall, the presumption is that the closer the fit between ecosystems and institutional systems, the better the relevant institutions will perform, at least in terms of sustainability’ (Young 2002: 20, referring to Berkes & Folke 1998). In the multi-level governance literature these task-specific governance institutions whose geographic boundaries relate to natural or cultural geographical boundaries are termed ‘Type II’ systems, as opposed to classical territorial jurisdictions which do not cut across each other, which typically possess an encompassing competency, and which are termed ‘Type I’ MLG systems (Hooghe & Marks 2003).

H 4 a: Governance of natural resources on natural scales leads to more ecologically rational outcomes than governance on territorial scales.

However, the 'institutional fit' approach in H 4 a is not entirely undisputed. Precisely because of the overlap of territorial governance units with 'new' ecosystem-related Type II governance scales, coordination of different actors and their identification with common tasks is said to be problematic, especially regarding common financing of measures imposed (Ingram 2008). This raises the question of the horizontal coordination (institutional interplay) between different actors, competences and policy fields, such as water resources planning, agriculture and industry (Moss 2003; Young 2002). Thus there appears to be a dilemma concerning the ecological rationality of governing natural resources on their 'appropriate' scale and the resulting transaction costs.

H 4 b: Governance of natural resources on natural scales leads to less ecologically rational outcomes than governance on territorial scales.

As a means to improve both institutional fit and horizontal interplay, participatory processes are recommended as 'tools to help us bridge the discontinuity between geographical and jurisdictional boundaries' and thus arrive at a more sustainable management of natural resources (Delli Priscoli 2004: 225).

H 4 c: Participation improves the fit between natural and governance scales and thus improves environmental outcomes.

5. Polycentricity of the whole (multi-level) governance system

Finally, regarding the environmental effectiveness of multi-level governance systems, again two competing hypotheses can be formulated.

On the one hand, policy implementation research assumes that complex MLG systems hamper governance effectiveness. The involvement of multiple administrative levels and 'clearance points' is regarded as inhibitive to policy implementation, because with each level of implementation and each further veto player (Tsebelis 1995) the probability of misinterpretation of the original policy programme, insufficient resources and opposing interests increases (Pressman & Wildavsky 1984 [1973]). In normatively more 'favourable' terms, the same circumstance is interpreted by the 'bottom-up school' within implementation research as that policy implementation itself regularly involves political decisions, and not only a mere technical transformation of programme into reality (Hill & Hupe 2003).

H 5 a: The more levels and actors involved in a policy implementation process, the lesser its effectiveness.

On the other hand, the systems-oriented approach regards diversity as a stabilising element. A multitude of horizontal and vertical, quasi-autonomous decision centres is assumed to be conducive to mediation between centralized and decentralized decision-making and therefore better able to adapt to external change and uncertainty by virtue of its flexibility (McGinnis 1999a), in particular in situations involving numerous causal interactions *between* multiple levels of decision-making (Cash et al. 2006). In this context, the cooperation of different stakeholders 'at different social and ecological scales in multi-level institutions and organizations' (Folke 2006) is regarded as crucial.

H 5 b: A high number of horizontal and vertical, quasi-autonomous decision points is better able to adapt to external change than hierarchical modes of governance, leading to a more sustainable resource use.

3. Methodology

The analysis relies on 47 case studies of participatory environmental governance that were conducted between 1970 and 2007 in the United States, Canada and Western Europe. Authored by political scientists, planning scholars, geographers or environmental sociologists, these texts were published in scientific journals or edited books and selected from a larger pool of case studies on citizen involvement in natural resources management, participatory planning and sustainable community programmes. The main selection criterion for the sample of this study was the completeness of information provided in the case reports. As a consequence, the sample is not fully representative for all cases in the pool and also does not entirely reflect the variety of all participatory processes undertaken in the case study countries. However, the selected sample covers a broad spectrum of political issues, scales, societal contexts and types of participation (see Table 1). The majority of case studies, both in the sample and the database, report on citizen involvement in Northern America, while fewer texts provide a detailed account of participation in European environmental management. This distribution attests the long history of collaborative conflict resolution in US eco-politics, which is also reflected in a larger share of publications in relevant journals and books. However, statistical tests have established that there are no significant correlation between geographic location of the process and dependent and independent variables, indicating that the predominance of US cases does not bias the analysis.

Case	Country	Year	Reference
301h Water Regulation Case	USA	1977	Burgess et al. 1983
Aargau Landfill Siting	CH	1993	Renn et al. 1998
Albemarle Pamlico Estuarine Study	USA	1990	Koontz et al. 2004
Animas River Stakeholder Group	USA	1998	Koontz et al. 2004
Ashtabula River Remedial Action Plan	USA	1990	Landre & Knuth 1993
Bay of Quinte Remedial Action Plan	CA	1988	Landre & Knuth 1993
Belmont Open Space Controversy	USA	1998	Layzer 2002
Brayton Point Coal Conversion	USA	1977	Burgess & Smith 1983
Chiwaukee Prairie Spatial Planning Case	USA	1983	Haygood 1995
Cold Lake Large-Scale Bitumen Extraction	CA	1978	Elder 1982
Collingwood Harbour Remedial Action Plan	CA	1990	Krantzberg 1996
Colorado Grand Canyon River Management Plan	USA	2001	Orton 2005
Colstrip Power Plant Mediation	USA	1978	Sullivan 1983
East Everglades Planning Study	USA	1986	Abrams et al. 1995
Foothills Water Management Case	USA	1976	Burgess 1983
Frankfurt Airport Airstrip Extension	D	1999	Geis 2005
Holston River Chemical Plant Mediation	USA	1974	Jaegerman 1983
Homestake Mining Case	USA	1980	Watson & Danielson 1983
Hudson River Power Station Settlement	USA	1980	Talbot 1984
Idaho Wilderness Controversy	USA	1990	Baird et al. 1995
Inland Northwest Field Burning Summit	USA	1990	Mangerich & Luton 1995
Interstate 90 Extension	USA	1976	Talbot 1984
Jackson Sewage Treatment Plant	USA	1978	Hill 1983
Lübeck Waste Management Proposal	D	1995	Wiedemann et al. 1995
Maine Radioactive Waste Citizen Advisory Group	USA	1990	Clary & Hornney 1995
Maine Transportation Policy Case	USA	1992	Bogdonoff 1995
Milwaukee Estuary Remedial Action Plan	USA	1991	Kaemmerer et al. 1992
Münchehagen Hazardous Waste Siting	D	1992	Striegnitz 1997
Neuss Waste Management Plan	D	1993	Fietkau & Weidner 1998
Pig's Eye Mississippi River and Wetlands Case	USA	1980	Nelson 1990a
Portage Island Park Management Case	USA	1979	Talbot 1984
Portland General Electric	USA	1980	Mogen 1986
Sand Lakes Quiet Area Oil Drilling Negotiation	USA	1981	Nelson 1990b
Sandspit Harbour Mediation	CA	1992	Sigurdson 1998
San Juan National Forest Mediation	USA	1983	Tableman 1990
Snoqualmie River Flood Protection Mediation	USA	1974	Dembart & Kwartler 1980
Spey River Basin Management Plan	UK	2001	Blackstock & Richards 2007
Spreewald Riparian Land Project	D	2002	Baranek & Günther 2005
Sugarbush Water Withdrawal Mediation	USA	1992	Fitzhugh & Dozier 1996
Swan Lake Hydroelectric Powerplant Conflict	USA	1979	Talbot 1984
Three Rivers Watershed	USA	1972	Mazmanian 1979
Umatilla Basin Mediation	USA	1992	Neuman 1996
Upper Narragansett Bay Waste Water Treatment	USA	1996	Burroughs 1999
Wildcat and San Pablo Creek Flood Management	USA	1972	Mazmanian 1979
Winfield Locks Toxic Waste Case	USA	1992	Langton 1996
Wisconsin Groundwater Commission	USA	1982	Edgar 1990
Yukon Wolf Management Team	USA	1992	Todd 2002

Traditionally, empirical research on participatory governance draws on conducting single or multiple case studies (small *N*). While this allows a qualitative, in-depth understanding of participatory decision-making, the obvious disadvantage lies in the lack of generalisability in the face of a multitude of different procedures as well as societal and environmental contexts (Ragin & Sonnett 2005). While classic works of comparative research (Lijphart 1971) significantly contributed to setting up most-similar or most-different research designs and, thus, to isolating causal factors, they keep relying on the analysis of a small number of cases only. While the comparative method has brought excellent research in many fields of interest, we maintain that in participation research, due to the large number of potential influencial factors, the study of a large number of cases (large *N*) represents a promising alternative based on replicable experiments and quantitative statistical analysis. For reasons of resources, however, these are only possible under highly controlled contexts and only for a limited set of (participatory) mechanisms (Mahoney 2007). One traditional way to integrate the knowledge of many empirical studies is to conduct reviews. However, reviews rely strongly on the subjective judgements of the reviewer and are seldom performed in a transparent or replicable way.

Hundreds of case studies on participatory environmental decisions, many of which provide information on environmental impacts, present a rich, yet extremely scattered and thus unexploited source of empirical data. As a method to integrate qualitative case-oriented research in a transparent manner, the proposed project will use the *case survey method* (Lucas 1974; Yin & Heald 1975; Larsson 1993), combining qualitative and quantitative techniques. The basic idea is to draw on existing and published case study reports, following the procedure proposed by Larsson (1993: 1516-7): "(1) Select a group of existing case studies relevant to the chosen research questions; (2) design a coding scheme for the systematic conversion of the qualitative case descriptions into quantified variables; (3) use multiple raters to code the cases and measure their interrater reliability, and (4) statistically analyze the data". Thus, case surveys draw on the richness of the case material, on different researchers and research designs. Case surveys are particularly useful when case studies dominate the area of research, when a broad range of conditions is of interest and when an experimental design is impossible (Larsson 1993), all of which applies to the proposed project. The method overcomes the major drawback of single case studies, namely their inability to generalise from their respective context. Case surveys thus combine the virtues of idiographic (case-based) and nomothetic (cross-case) research.

Using existing case studies as empirical material, the authors applied a detailed coding scheme in order to extract relevant information and subsequently conducted statistical data

analysis. To this end, a conceptual framework was developed including several dozen variables on the context, the process, and the outcomes of (participatory) environmental decision-making. Based on this framework, a coding scheme was elaborated and, after a careful reading of all case studies, used for coding most of the variables on a five-point semi-quantitative scale into an MS-Access database. In order to maintain intercoder reliability when interpreting data, the first dozen of cases were read by at least two coders. 77 per cent of these codes were identical, whereas 23 per cent were different, in which case the arithmetic mean was calculated. In total, the case studies provided information on 86 per cent of all variables. Finally, we calculated correlation coefficients among variables. As many variables turned out not to be normally distributed, we used Spearman's rho. For statistical analysis, we aggregated some of the original variables, e.g. by defining the new variable 'actor goals' as the arithmetic mean of all individual actor goals.

4. Empirical findings

In this section we will put the causal hypotheses discussed in section 2 to empirical test. At first, we analyse the extent to which public participation in decision-making improves the quality of policies and also their implementation. Secondly, we explore the influence of multiple levels of governance as well as spatial scales on environmental policy effectiveness.

1. Participatory versus top-down modes of governance

H 1 a: Participation of non-state actors leads to more 'ecologically rational' decisions than top-down modes of governance.

In Section 2 we discussed a number of possible causal factors that could affect the quality of environmental decisions. In order to determine whether participation really makes a difference as opposed to hierarchical decision-making, we compared participatory policy outputs to hypothetical top-down scenarios. The latter were based on the position held by the competent authority prior to or in the public involvement process.

According to our analysis, interests and political goals of state and non-state actors appear to be the most important causal factors explaining participatory policy outputs (mean actor goals correlate with $r = .84$ with $r < .001$. It is thus reasonable to assume that actor goals contribute as much to increases or decreases in environmental policy outputs. One 'negative' example are public authorities such as the US EPA, whose core agency goal is to reduce pollution and

improve environmental conditions, organise public involvement processes. For example, deliberations with agencies on a state-level or with non-state actors that do not share the US EPA's high ecological aspirations or whose political agenda is even opposed to environmental protection often lead to a watering down of agency proposals. Collaborative agreements therefore often represent a compromise between competing interests rather than a collective search for ecologically optimal solutions. A striking example is the *Spreewald* public involvement in Eastern Germany where local actors from forestry, fishery, agriculture and tourism in a public engagement process opposed strict measures concerning sustainable land use and water management in order to keep revenues high. However, other cases demonstrate that local actors can form a coalition with environmental protection agencies once they perceive their health and personal well-being to be in danger. The *Colstrip* power plant case gives evidence of how a tribe of Native Americans opposed modernisation of a nearby power plant on health grounds. In a public consultation process, they enforced additional air quality monitoring and protective measures as a precondition for the extension of the plant.

We also found evidence for environmentally beneficial impacts of direct face-to-face interactions ($r = .37$ with $p < .05$). At the same time, however, our calculations suggest that there is a negative correlation between two-way information flow in public participation and environmental output quality ($r = -.31$, $p < .05$). It appears that our case study sample contains a large number of studies reporting on involvement processes with non-state actors that are rather critical to stringent environmental regulation. In these cases, two-way communication channels open up opportunities for influence that are not always for the benefit of environmental protection. At the same time, no correlations between social learning and the quality of environmental decisions could be observed.

In sum, it appears that H1a cannot fully be confirmed since the causal relationships motivating the hypothesis vary to a large extent with regard to their relative importance and, what's more, can both support or prevent improvementsof environmental outputs. While participation is indeed able to open up networks for 'green' preferences, this effect is more than compensated by the possibility of local development interests to prevail. Our analysis also suggests that the involvement of non-state actors does not significantly increase the utility of local knowledge and the potential of social learning for achieving more sustainable outputs.

H 1 b: Participation of non-state actors leads to improved compliance with decisions and thus better outcomes and impacts in ecological terms than top-down modes of governance.

According to the academic literature, public participation contributes to improved compliance and policy implementation. This is due to the enhanced consideration of non-state actor interests in policy decisions and also due to acceptance gains based on procedural justice mechanisms. Our quantitative analyses suggest that, on the one hand, involvement procedures increase acceptance of public decisions and that, on the other hand, acceptance is a major precondition for compliance and a swifter implementation. In accordance with the theory, increased acceptance can mainly be attributed to consideration of the positions held by non-state actors, while other significant correlations could not be identified.

These findings can be illustrated by the *Holston River* case, which illustrates how collaborative decision-making between the US EPA and a large chemical plant contributed to improved implementation of water quality standards. Although the final agreement was, from an ecological point of view, less stringent than demanded by environmental movements, involvement of the business community helped to avoid time-consuming court trials and swiftly allowed water quality standards to be put into practice. In light of the dilution of environmental stringency aspect discussed above, it can be hypothesised that tricky disputes between environmental agencies and powerful economic actors can be resolved and policies more easily implemented when state agencies are willing to compromise. However, some studies reported cases of environmental public participation that experienced delayed implementation of collaboratively made decisions. More often than not this was the case when one or more parties perceived the process to be unfair or were deliberately excluded, as the *Albemarle-Pamlico* estuarine management case suggests.

2. Spatial relevance of actor interests

H 2 a: Citizens living in close spatial proximity to a natural resource tend to favour its economic exploitation, whereas those living farther away tend to favour its conservation.

In order to test this hypothesis, we coded the geographic scale of the participatory process as an indicator of the proximity of non-state actors to the environmental problem at hand and examine this against the actor positions held. According to our analysis, there is no statistically significant correlation between the scale of participatory governance and interests voiced in the process, refuting the hypothesis. A closer look into the case studies, however, reveals that actor interests are to a considerable extent dependent on general economic trends in the local community and the broader region. The hypothesis, therefore, requires further refine-

ment and should allow for flexibility with regard to resolving the trade-off between economic development and environmental protection in certain policy contexts.

For example, in the *Umatilla Basin* mediation the opposing interests of local and non-local actors can be observed in one and the same case. In the 1970s, fishermen, farmers and environmentalists discussed whether rivers in Oregon should be diverted for the benefit of local agriculture and at the expense of fisheries. While local actors mainly pursued their economic well-being during the negotiations, it was external environmental activists who effectively defended ecological values. However, public participation in the remediation of the Great Lakes gave evidence that economy and ecology can turn out to be surprising bedfellows. Based on a bilateral agreement between Canada and the US, the serious pollution problems of this singular aquatic environment were to be resolved in a number of local participatory processes that were closely tied to supranational negotiations. In the *Ashtabula River* and *Collingwood Harbour* cases, local actors were willing to improve environmental conditions as this would support economic development in an industrially deprived region, e.g. in the fishery or touristic sector.

H 2 b: Where decision competences regarding environmental issues are on lower levels of governance, a stronger and more influential participation of citizens with economic interests can be expected.

In our analysis, we coded and tested correlations between actor interests, willingness to participate in collaborative decision-making and also scale of governance. No correlation between governance scale and the mean of actor interests and participation tendency is found. However, a slightly negative yet statistically not significant correlation between regulatory scale and actor influences is revealed. Based on in-depth study of the qualitative case studies, we found indeed evidence sustaining the hypothesis in a number of cases. However, many other policy contexts and involvement processes are characterised by complex factorial relationships that are not accounted for in the hypothesis.

In Florida's *East Everglades*, park managers and environmentalists were in conflict with local farmers who increasingly withdrew water to irrigate their fields at the expense of a nationally protected and ecologically valuable marshland. The mediation resulted in a compromise which has to be interpreted as a success for local agriculture, taking into account the strong legal statute of the National Park. The main reasons behind the compromise were concerns regarding the socioeconomic wellbeing of the region. In other cases, however, local economic interests failed to have a major impact on a participatory decision as a result of strategic mis-

takes, as the *Pig's Eye* case illustrates, where an economically promising dredging project in Minnesota could not be realised despite that it also had the support of local politicians. This was because the dominant business coalition felt, thanks to its political and economic power, unwilling to continue a public involvement exercise and to compromise in favour of environmental interests. Instead, they preferred to fight their way through the courts and lost – to the advantage of members of the environmental movement.

3. Local-scale versus higher-scale decision-making

H 3 a: The environmental effectiveness of decisions correlates *positively* with the scale of the governance unit.

H 3 b: The environmental effectiveness of decisions correlates *negatively* with the scale of the governance unit.

These two hypotheses were put to the test by looking for correlations between outcome-oriented variables and both scale of the participatory process and scale of the competent authority. In our analysis, we were unable to identify any positive or negative correlation between these factors. This could be explained by the fact that both hypothetical effects, the gains of group learning and social capital on the one hand and a profound interest in a functioning local economy on the other, even each other out. However, within the scope of this paper it was not possible to test this newly developed assumption. Alternatively, it can be conceived that different subsets of cases display either one of the hypotheses, such that the dataset as a whole does not display any correlation. If this is true, then this would call for context variables to be found that determine the case subsets. Again, this is a challenge for future research. Nevertheless, the findings relating to hypothesis 2 suggest that the geographical distribution of actor interests might provide a starting point to further understand the effects of policy scale on policy decisions in environmental governance.

4. Spatial fit between governance scales and natural scales

H 4 a: Governance of natural resources on natural scales leads to more ecologically rational outcomes than governance on territorial scales.

H 4 b: Governance of natural resources on natural scales leads to less ecologically rational outcomes than governance on territorial scales.

As a rough indicator of spatial fit, we calculated the absolute value of the difference between the geographical scale of the environmental problem and the geographical scale of the participation process as well as the difference between problem scale and scale of the leading authority's jurisdiction. However, there is no denying that in particular those cases with a natural scale larger than the regulation scale are of interest, because this arrangement implies either collaboration between authorities of different jurisdictions or that the misfit has been ignored at the expense of the environment. According to our analysis and contrary to theory, however, neither positive nor negative correlations could be identified. The main reason to account for this finding appears that in the vast majority of analysed cases, the governance scale indeed matches or extends the natural (ecological problem) scale; only in four out of 47 cases the natural scale actually exceeded the governance scale. Methodologically, a considerably larger sample would have to be studied in order to provide any significant results for this theses. On the other hand, our analysis does show that spatial misfit appears to be a less sailient issue than the literature has been assuming.

H 4 c: Participation improves the fit between natural and governance scales and thus improves environmental outcomes.

In order to test this hypothesis, we checked for cases where a participatory process was used as a means to match governance scale with the natural boundaries of the policy problem at hand by involving a number of state or non-state actors from regions geographically much more remote than the competent authority. In our sample, we have only four cases that match these criteria so that statistical analysis was inappropriate. A qualitative assessment did give evidence for significant impacts on environmental outputs and outcomes resulting from rescaling efforts. In the *Foothills* case, where in order to guarantee water supply for the city of Denver construction of an ecologically inferior dam was debated, collaborative governance contributed to achievement of an identical match between the natural scale and scale of governance. However, ecological improvements could not be observed as a result of the rescaling. On the contrary, the large number of state agencies in different sectors and at different policy levels increased the number of different positions held and represented a major handicap with regard to finding common ground. Apparently, rescaling by means of participatory processes appears to be able to achieve identity of scale but also can lead to involvement of actors who do not necessarily share ecological goals. This is not only the case with regard to non-state actors; public agencies entrusted with tasks other than environmental protection may be as obstinate as business or agriculture.

5. Polycentricity of the whole (multilevel) governance system

H 5 a: The more levels and actors involved in a policy implementation process the lesser its effectiveness.

H 5 b: A large number of horizontal and vertical, quasi-autonomous decision points is better able to adapt to external change than hierarchical modes of governance, leading to more sustainable resource use.

These two contradictory hypotheses have been tested by coding and checking for correlations between the number of implementing agencies participating, the number of policy levels involved and policy outcome variables. Our findings suggest that the number of governance levels involved strongly correlates with environmental output quality ($r = 0.40$ with $p < .01$), while the number of agencies shows a slightly weaker, but still clear correlation to the quality of policy outputs ($r = 0.35$ with $p < .05$).

Striking examples of improvements in environmental policy as a result of decision-making on multiple levels can be witnessed in the Great Lakes water management regime. The case studies on remedial action planning at *Ashtabula River*, the *Bay of Quinte* and *Collingwood Harbour* all demonstrate that the interaction between local, regional and supranational actors contributed to a shared understanding of the problems at hand, a coherent set of measures as well as provision of the necessary resources to secure swift policy implementation. Furthermore, participatory processes in a multi-level governance context often seem to be characterised by hierarchically-set policy goals. Thanks to participation of a number of different actors, in particular higher level agencies, compliance with these policy goals is assured. However, this is not to say that hypothesis H5a has been refuted. In fact, this hypothesis was initially elaborated in relation to a top-down policy process with a sequential implementation chain. Implementing agencies often choose to delay implementation on substantive grounds or fail to comply due to resource problems. In participatory decision-making, agencies potentially imposing delays in implementation are under much greater pressure to justify these, in particular to non-state actors. Also, resource scarcities and other anticipated causes of delay can be addressed earlier.

5. Summary and outlook

Participatory and multi-level, scale-adapted governance are current responses to lacking effectiveness of environmental policy in Europe and other modern democracies. Scholarly literature has remained sparse and ambiguous about the empirical effects of these modes of governance. In particular, the relation between public participation on the one hand and multi-level governance and re-scaling on the other hand as well as its environmental effects have barely been treated. This paper aimed to address the issue of the environmental effectiveness of participatory and multi-level governance both conceptually and empirically. To this end, five sets of hypotheses were developed, drawing on scholarly literature on multi-level governance, policy implementation, public participation and complex systems. Hypotheses relate to participatory versus top-down modes of governance; the spatial relevance of actor interests; local-scale versus higher-scale decision-making; the spatial fit (or misfit) between natural scales and governance scales; and to the polycentricity of whole (multi-level) governance systems. Reflecting different assumptions in the respective fields of research, some of the hypotheses contradict each other, putting forward competing claims.

In order to put these claims to an empirical test, we used a comparative meta-analysis of 47 case studies on environmental decision-making in North America and Europe, which is part of a larger ongoing research project (Newig & Fritsch 2008; Fritsch & Newig 2009, in press). On the quantitative side, we calculated correlations between relevant variables; on the qualitative side, we searched the case material for convincing evidence of causal processes that sustain or refute the hypotheses. Almost all processes described in the literature could be found in some of the analysed case studies, which indicates that scholarly work in the field provides meaningful assumptions regarding the effectiveness of participatory and multi-level governance. However, only two sets of hypotheses yielded significant statistical material: Regarding hypotheses 1a/b, more than any other variable the environmental preferences of the involved actors determine the environmental outputs (and outcomes) of decision-making. Moreover, we found that face-to-face, but not mere two-way communication appears to positively influence the ecological standard of decisions. Regarding hypotheses 5a/b, our analysis suggests that a highly polycentric governance system comprising many agencies and levels of governance yields higher environmental outputs than rather monocentric governance.

Our findings suggest that further research is needed in order to understand the specific relationship between multi-level governance and public participation in environmental governance:

In light of our analyses it can, firstly, be assumed that many hypotheses articulated in the literature need further refinement with regard to contextualisation. Some of the approaches tested appear to be sometimes-true approaches while others could be confirmed to a large extent, but in-depth analysis of case studies reveals that their underlying causal relationships were different or more complex than predicted by theory. Further research will have to draw on a more comprehensive comparison of empirical material in order to yield a sufficient number of instances on particular participatory and multi-level aspects. This includes a broad control of third variables and the development of specific conditions under which certain approaches will have explanatory power.

Controlling for third variables as a precondition for rigorous in-depth case studies implies, secondly, that small-N research designs be paralleled by large-N qualitative studies. A higher number of cases might contribute to isolating these causal factors that explain aspects of participatory multi-level governance in a majority of cases from those that appear to be relevant in specific situations only.

Studies focussing on the relationship between multi-level governance and public participation are scarce and theoretical approaches underdeveloped. We argue, thirdly, that future research should include a broader variety of case studies, in particular with regard to their effectiveness and achievement of preset goals. There is no denial that public participation *can* contribute to deliver effective, legitimate and efficient environmental policies in a multi-level context. However, we need to better understand which contextual or process factors make best-practice cases so good in order to successfully learn from them. Comparisons with problematic, complex or failed cases can help to achieve that goal.

Finally, we hope that our conceptual considerations and initial empirical findings will stimulate fellow researchers to join the effort to better understand the complex relations between participatory, multi-level and scale-adapted governance and the effectiveness of environmental policy.

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